REMARKS:

As amended, applicant's invention is directed to a method of treating manure comprising:

a) mixing a quantity of manure with lime such that said mixture has a pH above 11.0 and ammonia is volatliized within said mixture;

b) drawing off ammonia volatilized from said mixture during mixing, thereby producing deodorized and sterilized manure;

c) adding a cationic, anionic or non-ionic flocculating or coagulating polymer to said deodorized and sterlized manure, thereby producing a slurry comprising a floc portion and a liquid portion;

d) separating the floc portion from the liquid portion of the slurry;

e) adding $MgCl_2$, $MgSO_4$, $MgCO_3$ or magnesium oxide a coagulant polymer to said liquid portion, thereby promoting formation of struvite-containing flocs within the liquid portion; and

f) separating the struvite-containing flocs from the liquid portion.

Support for the volatilization of ammonia and other gases within the mixture and their withdrawal may be found at least at page 7, lines 1-7.

Support for the deodorization and sterilization of the manure may be found at least at page 7, lines 13-14.

Support for the use of a cationic, anionic or non-ionic flocculating or coagulating polymer may be found at least at page 7, lines 18-22.

Support for the formation of a slurry may be found at least at page 8, lines 14-19.

Support for the addition of $MgCl_2$, $MgSO_4$, $MgCO_3$, magnesium oxide to promote formation of struvite-containing flocs within the liquid portion may be found at least at page 9, line 3 to page 10, line 5.

It is believed that the amendments to the specification described above overcome the 35 USC 132(a) objections. Specifically, reference to 'C-496PG' has been deleted. It is further noted that the application as filed describes the first coagulating agent as 'a flocculating or coagulating polymer known in the art, of anionic, cationic or non-ionic type, or a combination of such polymers and polyacrylamides. These coagulating and flocculating agents known in the art are currently used in the flocculation of sewage and other industrial and agricultural effluents. Many of these agents are polymers and/or inorganic chemicals.' and then proceeds to define several flocculating agents, including SUPERFLOC. As noted by the examiner, SUPERFLOC refers to a family of flocculants which may be used in the invention as may other compounds described and/or listed within the application.

Regarding the objection to claims 1, 8 and 9 for failing to comply with 37 CFR1.121 for use of the term 'coagulating polymer', applicant notes that the previous office action stated that 'alum' was not known in the art as a 'coagulating polymer' but there does not appear to have been an objection for use of the term 'coagulating polymer'. It is further noted that claims 8 and 9 have been cancelled and claim 1 has been amended to refer to a 'cationic, anionic or non-ionic flocculating or coagulating polymer'. As discussed on page 7, line 18 to page 8, line 2, such agents are well-known in the art for the flocculation of sewage and other industrial and agricultural effluents. Accordingly, it is held that this term would be well understood by one of skill in the art.

The drawings and specification have been amended so that the polymer addition is defined as '21'.

Claims 8 and 9 were rejected under 35 USC 112. These claims have been cancelled.

Claims 1-10 and 18-20 were rejected under 35 USC 103(a) as unpatentable over Van Slyke (US Patent 6,916,426) in view of Sower (US Patent 6,409,788).

The office action states that 'the claims differ from Van Slyke et al. by reciting steps for mixing the manure with lime to produce a basic pH, and adding a second coagulating polymer and/or struvite-promoting compound to a separated liquid portion. Sower disclose ... that it is known in the art to mix manure with lime to produce a pH of about 12, and to utilize flocculants or coagulating polymers...'

Applicant respectfully notes that at column 2, lines 14-26, Van Slyke states that 'The present invention is based on an appreciation, by the present inventors, of the fact that the extraction of nitrogen, potassium and phosphorus from animal waste material is substantially enhanced if the treatment is performed promptly after the production of the waste material by animals. Most particularly, potassium is present in animal waste material in the form of an insoluble potassium urate. The present inventors have found that a substantial amount of the potassium in animal waste material can be extracted in a solid form, as potassium urate, before microbial action breaks down the potassium urate to leave potassium and ammonium in solution.'

Van Slyke further states at column 2, lines 57-60 that 'a major portion of the phosphorous in the slurry can be extracted with the solid material in step b) in solid form, and any remainder can be subsequently extracted by adding lime to the liquid'.

Thus, according to Van Slyke, most of the nitrogen in the hog manure is excreted as uric acid and potassium combines with uric acid to form insoluble potassium urate which can be extracted through the solid-liquid separation process. Van Slyke further

states that it is preferred that the treatment be conducted with fresh manure before the insoluble potassium urate goes into solution due to bacterial action

However, it is well known from published literature on the effect of pH on the formation and solubility of urates that solubility of uric acid and urates increases with increasing pH and the lowest solubility occurs at a pH of less than 6.0. Fresh manure typically has a pH of 7.0 to 8.0. This means that at the pH of 7 to 8.0 of fresh manure most of the uric acid and urates will be in solution.

Thus, Van Slyke expressly teaches against adding lime to manure to raise the pH to above 11 as taught by applicant. Specifically, Van Slyke would not add sufficient lime to raw manure to produce a mixture having a pH above 11 because potassium urate is highly soluble at that pH, meaning that a substantial amount of the potassium could not be extracted in solid form as desired by Van Slyke.

Furthermore, as discussed above, Van Slyke states that 'a major portion or even all of the phosphorous in the slurry can be extracted with the solid material'. Given that struvite is a magnesium-phosphorous compound, there would therefore be no need to add struvite-promoting compounds to Van Slyke as according to Van Slyke the phosphorous has already been removed.

Thus, Van Slyke teaches a process wherein a manure slurry is processed while ammonia-nitrogen and potassium remain in a solid form. This is accomplished by processing the waste soon after production prior to microbial breakdown of the waste under conditions wherein the potassium urate remains insoluble (acidic pH). The flocculant isolated therefrom contains a major portion of the ammonium-nitrogen and potassium for the waste slurry, meaning that subsequent removal of struvite (a magnesium-phosphorous compound) would be unnecessary. Van Slyke does however teach the addition of lime to extract any

remaining phosphorous from the liquid portion prior to adding zeolite to absorb remaining potassium and ammonium.

Accordingly, it is held that the combination of Van Slyke and Sower is improper for the reasons described above and in any event this combination does not teach applicant's invention.

Specifically, while Sower does teach that lime can be added as a flocculant (column 14, lines 40-47), Sower also describes many other compounds which can be added as a flocculant, indicating no preference for lime and furthermore providing no guidance as to how much lime is to be added or that a specific pH range is to be attained. Accordingly, even if one of skill in the art was to combine Van Slyke and the teachings of Sower regarding the use of lime as a flocculant, Van Slyke teaches that the ammonia-nitrogen and potassium are to be removed in solid form, meaning that lime would be added but only so an acidic pH would be maintained so that the urates remained in solid form. Furthermore, given that care is taken to ensure that the ammonia-nitrogen remains in solid form in Van Slyke, there would be no need to remove gaseous ammonia as taught by Sower and as described in applicant's invention. Finally, according to Van Slyke most if not all of the phosphorous is removed during the initial extraction, meaning that according to Van Slyke there would be no need to add the struvite-promoting compounds.

Accordingly, it is believed that it is not possible to produce a workable combination of Van Slyke and Sower aside from the use of lime as a flocculant at an acidic pH as discussed above. It is further noted that as discussed above, that combination does not provide applicant's invention wherein lime is added to produce a manure slurry having a pH above 11.0.

Specifically, it is again noted that the office action states that the 'claims differ from Van Slyke et al. by reciting steps for mixing the manure with lime to produce a basic pH

and adding a second coagulating polymer and/or struvite-promoting compound to a separated liquid portion.' It is noted that as discussed above, the teachings and stated goals of Van Slyke are incompatible with adding lime to a pH above 11 as taught by applicant and according to Van Slyke, the majority or substantially all phosphorous is removed during the initial processing, meaning that there would be no need to promote struvite formation if following the teachings of Van Slyke. In other words, the addition of lime to a pH above 11 is contrary to the teachings of Van Slyke as the urates would remain in solution and would not be efficiently removed as solids which Van Slyke teaches is critical (together with prompt processing of waste) for his invention. Similarly, the addition of struvite-promoting compounds would be viewed as unnecessary according to Van Slyke who teaches that most of the phosphorous will be removed as solids and any remaining phosphorus will be removed by the second lime treatment.

In addition, the claims have been amended to state that sufficient lime is added to volatilize gases which are removed from the manure mixture, as discussed above, further distinguishing applicant's invention from Van Slyke.

It is further believed that the claims have been amended to recite the formation of specific products, thereby further distinguishing applicant's invention from the cited references.

Finally, the attached affidavit clearly shows that applicant's invention produces significantly different results from that taught by Van Slyke. The examiner's attention is drawn to the sections of the tables showing E. coli levels, which clearly show the effectiveness of applicant's invention at reducing bacterial levels and accordingly sterilizing the waste. It is also believed that this demonstrates the surprising effectiveness of administering lime to raw manure rather than administering lime following an initial flocculation step as taught by Van Slyke.

Further and more favorable consideration is respectfully requested.

Respectfully submitted

GURUNATHAN LAKSHMAN

PER: _____
Michael R. Williams
Registration # 45,333

April 7, 2008
Enc.()

Winnipeg, Manitoba, Canada
Telephone (204) 947-1429 - FAX (204) 942-5723

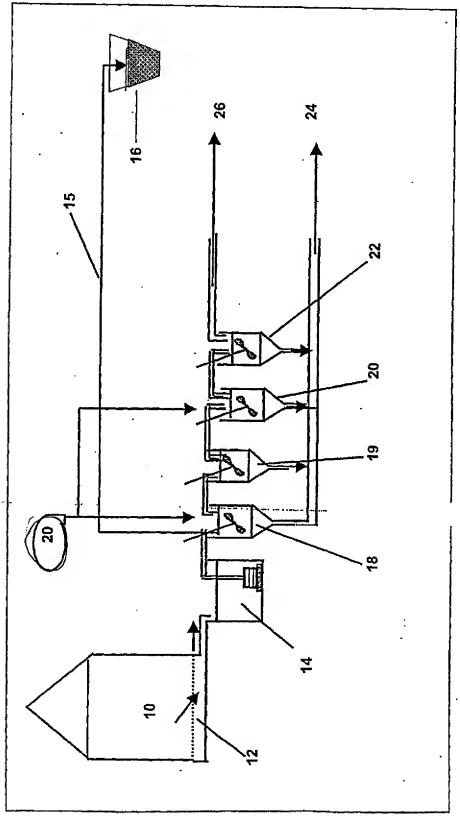

Fig 1.

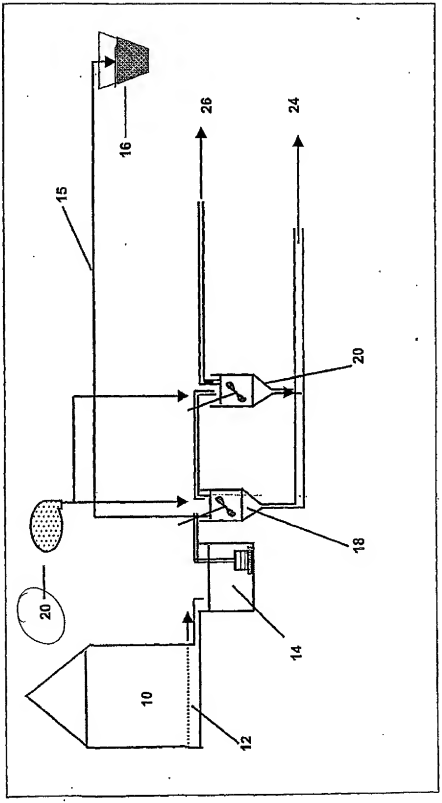

Fig 2.